Claims

[c1] A method of scheduling data transmissions in a wireless data network, comprising:
(a) receiving a request to transmit data of a size s to a receiver;
(b) using the request size s and transmission characteristics to the receiver to select overall power and number of codes to assign to the request over an entire schedule;
(c) rounding results from step (b) so that every selected code is assigned a power that achieves a feasible data rate; and
(d) allocating the results of step (c) in each scheduling frame in accordance with a quality of service metric.

[c2] The method of claim 1 wherein the overall power and the number of codes is selected using resource augmented competitive analysis.

[c3] The method of claim 2 wherein the overall power p and the number of codes k is selected to minimize the following expression:

$$\frac{p_j^c}{P}+\frac{k_j^c}{C}$$

where P is the total power that can be transmitted and C is the total number of codes that can be assigned to receivers in a time frame in the schedule..

[c4] The method of claim 3 wherein p and k are selected with respect to a resource-augmented demand.

[c5] The method of claim 1 wherein the quality of service metric comprises minimizing maximum response time of data transmission.

[c6] The method of claim 1 wherein the quality of service metric comprises minimizing a weighted response time of data transmission.

[c7] The method of claim 1 wherein the quality of service metric comprises maximizing stretch of data transmission.

[c8] The method of claim 1 wherein the quality of service metric comprises maximizing flow of data transmission.

[c9] A method of scheduling data transmissions in a wireless data network, comprising:
(a) receiving a request to transmit data of a size s to a receiver;
(b) using the request size s and transmission characteristics to the receiver to select overall power and number of codes to assign to the request over an entire schedule, such that the power p and number of codes k minimizes the expression

$$\frac{p_j^e}{P}+\frac{k_j^e}{C}$$

where P is the total power that can be transmitted and C is the total number of codes that can be assigned to receivers in a time frame in the schedule; and
(c) allocating the results of step (b) in each scheduling frame in accordance with a quality of service metric.

[c10] The method of claim 9 wherein p and k are selected with respect to a resource-augmented demand.

[c11] The method of claim 9 wherein the quality of service metric comprises minimizing maximum response time of data transmission.

[c12] The method of claim 9 wherein the quality of service metric comprises minimizing a weighted response time of data transmission.

[c13] A method of scheduling data transmissions in a wireless data network, comprising:
(a) receiving a request to transmit data of a size s to a receiver;
(b) using the request size s and the transmission characteristics to the receiver to select a number of codes needed to complete the request using a power of P/C per code assuming a reduced demand; and
(c) rounding results from step (b) so that every selected codes is assigned a power that achieves a feasible data rate; and
(d) allocating the results of step (c) in each scheduling frame in accordance with a quality of service metric.

[c14] The method of claim 13 wherein, if a request satisfying the quality of service metric leaves unused power/codes in that scheduling frame, then another

request is packed into the scheduling frame.

[c15] The method of claim 13 wherein the request with an earlier release time has higher priority over other requests.

[c16] The method of claim 14 wherein, if the request with the earliest release time leaves power/codes unused in that scheduling frame, then another request is packed into the scheduling frame.

[c17] The method of claim 13 wherein the request with a highest value of power per code has higher priority over other requests.

[c18] The method of claim 17 wherein, if the request with the highest value of power per code leaves power/codes unused in that scheduling frame, then another request is packed into the scheduling frame.